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Original Research Article

Intra-hospital mortality and morbidity and six-month follow up of patients with myocardial infarction

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ABSTRACT

Background: Cardiovascular disease is one of the leading causes of disability and premature death worldwide. Adjustment of risk factors has been shown to reduce morbidity and mortality in people with diagnosed or even undiagnosed cardiovascular disease. In this study, we examined mortality and morbidity over a six-month period among patients with MI.
Methods: This cross-sectional study was done on 322 patients admitted to Imam Khomeini Hospital in Ardabil during September 2020 to February 2020 with the diagnosis of acute myocardial infarction and their mortality and morbidity rates and their relationship with age, gender, risk factors (diabetes, hypertension, family history) and the type of treatment performed. The data of all patients will be collected in special forms and will be analyzed using SPSS software.
Results: Of all patients, 27 died, all of whom were older (over 59 years), and about 125 had morbidity during 6 months, the majority (78%) being older. In terms of gender, mortality and morbidity rates were lower in men than in women. Risk factors lie diabetes, hypertension and positive family history had a significant impact on mortality and morbidity at first glance and findings showed that streptokinase injection was superior to primary coronary intervention with mortality and morbidity.
Conclusions: Findings showed that mortality and morbidity rate in acute myocardial infarction was directly related to the type of treatment (primary coronary intervention versus streptokinase injection), age, sex, being diabetic, having hypertension and having a positive family history.

Keywords: Mortality, Morbidity, Acute myocardial infarction

INTRODUCTION

Acute myocardial infarction (AMI) is one of the most common causes of death and disability in the world and its prevalence is increasing in the world.[1] Acute myocardial infarction is the main cause of death in developed countries and the cause of a large number of hospital admissions and accounts for a major part of health care costs.[2] 45% of deaths in all ages and 64% of deaths in those over 70 years old are due to cardiovascular diseases. The amount of life lost due to cardiovascular diseases is 1,183,188 years. Therefore, cardiovascular diseases are the first cause of death in Iran with 45% of deaths and 26% lost years.[3] Follow up of patients diagnosed with acute myocardial infarction is important in terms of understanding the mortality and morbidity rates following myocardial infarction and the potential benefits of aggressive treatment methods and secondary prevention.[4] Considering the world's aging population, population growth and the increasing

prevalence of survivors after acute heart infarction indicate the greater importance of the disease in society.[5]

Survivors of myocardial infarction face an increased risk of cardiovascular disease, including increased mortality. The prognosis of different people is different according to the presence or absence of risk factors. Factors such as old age, severe obesity, high blood pressure, history of previous stroke, diabetes, smoking and blood lipid disorders, which are the main and independent risk factors.[6] In various mortality and morbidity studies more women than men have been reported in short term (hospital and 30 days after) and long term follow up of acute myocardial infarction and this rate is higher in black women than in white women. This effect is primarily seen in younger women (less than 55 years) and gender differences decrease consistently with age. It is thought that the high premature mortality in women may be due to the difference in initial symptoms at the time of referral.[6] Investigating 30-day mortality in the context of acute heart infarction is very important as an indicator of hospital performance and how to care after discharge and its effects in improving the results of treatment. Therefore, comparisons between health care systems can provide important and practical insights to guide policy development and clinical practice.[7] Since the short-term survival after acute myocardial infarction is improving, the investigation of its long-term prognosis becomes more important according to studies, long term survival after acute heart infarction has improved over the past three decades in developed countries. This information is very important for doctors, public health professionals and decision makers to support clinical decisions and planning for community health.[8] The present study was conducted with the aim of investigating mortality and morbidity in patients with acute myocardial infarction.

METHODS

In this cross-sectional descriptive study, the number of 322 patients who were diagnosed with acute heart infarction during September 2020 to February 2020 were selected randomly by random sampling method and examined in Ardabil city Imam Khomeini hospital. The necessary sample size was calculated based on Cochran formula in 95% confidence interval and 0.05 accuracy rate.

Inclusion and exclusion criteria

Patients who clinically confirmed for MI by cardiologist were entered in the study and other patients who referred to clinic without MI problem were excluded from the study.

Procedure

All patients were followed up for a period of six months and their mortality rate was recorded during this time. The information of all patients, including age, sex, risk factors of coronary artery disease (diabetes, high blood pressure, positive family history), type of heart attack, type of treatment performed and the time of referral are collected in special forms.

Statistical analysis

All collected data were analyzed by using statistical methods in SPSS version 21. Also, we used some statistical tests like Chi-square for analysis of data.

RESULTS

The type of treatment was primary coronary intervention in 72.6% of patients and streptokinase injection in 27.4%. The average age of the patients was 59 with a standard deviation of 11 years. The highest age was 88 years and the lowest age was 30 years. 67% of patients were male and 73% had high blood pressure (Table 1).

Table 1: Frequency distribution of demographic and clinical variables of the studied patients.

Variables		N	%
Gender	Man	215	66.7
	Female	48	33.3
Diabetes	+	93	28.8
	-	229	71.2
High blood pressure	+	235	72.9
	-	87	27.1
Family history	+	127	39.4
	-	195	60.6

The result of the in-hospital treatment of the majority of patients (about 96%) was successful and they were discharged from the hospital with a good general condition (Table 2).

Table 2: The result of treatment and mortality among patients in the next six months.

Variables		N	%
The result of in-hospital treatment	Successful	309	95.5
	Unsuccessful	13	4.1
Mortality	+	27	8.4
	-	295	91.6
Morbidity	+	125	38.8
	-	197	61.2

At the end of six months of follow up, 27 patients (8.4%) died, 56% were men, 78% had diabetes 100% high blood pressure and 56% a family history of the disease and all patients were over 55 years old. Out of 125 patients with morbidity within six months, 78% were over 59 years old, 64% male, 54% had diabetes and 87% high blood pressure, 44% a positive family history and 8% died. The most common complication with 51 requiring re PCI was (Figure 1).

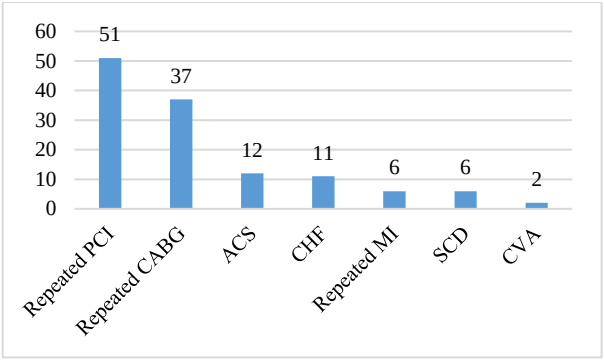

Figure 1: Frequency distribution of type of morbidity among patients.

The relationship between mortality and all influencing variables, including the type of treatment received, diabetes, high blood pressure, age and gender and family history of the disease was significant (Table 3).

The relationship between morbidity and all influencing variables, including the type of treatment received, diabetes, high blood pressure, age and sex and family history of the disease was significant (Table 4).

DISCUSSION

In this study, the six-month mortality and morbidity rates in patients treated with streptokinase injection were significantly higher than those treated with primary coronary intervention. Rai et al in a study showed that there was no significant difference in terms of recurrent heart infarction, angina, bleeding and cerebrovascular accident between the groups treated with thrombolytics and primary coronary intervention.

Table 3: Relationship between mortality and influencing variables.

Variables		Mortality				P value
		Alive		Dead		
		N	%	N	%	
Type of treatment	Streptokinase injection	75	85	13	15	0.011
	Primary coronary intervention	220	94	14	6	
Age (years)	<59	130	84	25	16	0.001
	>59	165	98	2	2	
Sex	Man	200	93	15	7	0.001
	Female	95	88	12	12	
Diabetes	+	73	78	21	22	0.001
	-	222	97	6	3	
High blood pressure	+	208	88	27	12	0.001
	-	87	100	0	0	
Family history of the disease	+	112	88	15	12	0.003
	-	183	93	12	7	

Table 4: Relation between morbidity and influencing variables.

Variables		Morbidity				P value
		With complications		Being a complication		
		N	%	N	%	
Type of treatment	Streptokinase injection	37	43	51	57	0.001
	Primary coronary intervention	160	68	74	32	
Age (years)	<59	79	51	67	49	0.001
	>59	118	71	49	29	
Sex	male	131	60	84	40	0.001
	female	66	62	41	38	
Diabetes	+	37	39	51	61	0.001
	-	160	70	68	30	
High blood pressure	+	127	54	108	46	0.001
	-	70	80	17	20	
Family history	+	69	54	58	46	0.042
	-	128	66	67	34	

Nevertheless, after thrombolytic therapy; The serum creatinine level was six times higher than in the primary coronary intervention group. Also, there was no significant difference in the rate of hospital mortality and complications among thrombolytic therapy and primary coronary intervention patients. Also, in the six-month follow-up, patients in the group treated through primary coronary intervention had a lower need for re hospitalization due to heart disease compared to the group treated with thrombolytics.[1] Nouhi showed in a study that primary coronary intervention in elderly patients can be associated with fewer complications and more survival.[9] Khosravi et al showed that the probability of one year survival in patients receiving streptokinase (81.6%) was significantly higher than other patients , even after quitting smoking and it was concluded that the use of streptokinase as a thrombolytic drug was effective in the survival rate of patients.[10] In this study, the six-month mortality and morbidity rates were higher in elderly patients than in other patients and the probability of morbidity and mortality increased with the age of the patients. In a study, Smolina et al showed that old age, lack of intervention for blood resupply and the presence of risk factors are associated with a higher risk of heart attack recurrence. These results reinforce the importance of acute clinical care and secondary prevention in improving the long-term prognosis of patients hospitalized with acute myocardial infarction.[8]

Also, in the study conducted by Kishpakh, the results showed that older people experienced more mortality during follow up and according to this study, old age is an important determining factor in long term mortality after acute heart infarction.[11] In Amani et al 's study, the mortality rate among all patients within one year was 10.5% and the effective factors on the survival rate based on the Cox regression model were: Diabetes, old age, taking streptokinase and having heart block. It was concluded that having the survival rate and the factors affecting it in patients with acute heart attack can provide optimal services for the patients, as well as special measures to control and reduce the death rate caused by acute heart attack and increase the quality of life.[12] In this study, the six-month mortality and morbidity rates were higher in women than men. In the study by Wilson et al, mortality and morbidity rates were higher in women than men in short term (hospital and 30 days after) and long term follow up of acute myocardial infarction and this rate was higher in black women than in white women.[6]

In Kayani's study, 70% of patients were women and 30% men. 48% were illiterate and the average age of the patients was 58.3 years. Statistical tests showed that there was a significant correlation between female gender and average visit time.[13] In Khosravi's study, the probability of one year survival was 69.9% in men and 65% in women, which did not show a significant difference and gender did not affect the probability of one year survival in these patients.[10] In this study, the rate of morbidity and mortality in six months was higher in patients with diabetes than in other patients. In the study of Amani et al , diabetes was an effective factor on the survival rate and diabetic patients had a lower survival rate.[12] In Hashemi et al 's study , 60% had high blood pressure, 34.4 percent diabetes and the follow up showed that 32.3 percent of the patients at least one of the major cardiac complications in the long term that patients with high blood pressure and diabetes showed more complications.[14] In Salehi et al's study, the results showed that having diabetes increases the mortality and morbidity rates, and patients suffering from coronary artery disease after stenting can reduce the possibility of adverse cardiac events by controlling their weight and diabetes status.[15] In Khosravi et al study, 24% of the patients were diabetic and 36 (36.9%) of the patients died of heart disease within one year and it was concluded that gender and history of previous ischemic diseases and diabetes in these patients had no effect on the probability of one year survival.[10] In the study conducted by Jonas et al the results showed that the mortality rate in patients with diabetes and high blood pressure is higher than other groups. Having diabetes showed an increase in the death rate from myocardial infarction after one year compared to non-diabetic patients.[16]

In this study, the six-month mortality and morbidity rates were higher in patients with high blood pressure. In the study by Johansson et al the results showed that the association with risk factors such as diabetes, high blood pressure and peripheral vascular disease, older age, decreased renal function and a history of stroke lead to worse outcomes after myocardial infarction.[5] In Hashemi et al study, the follow ups showed that 32.3% of the patients had at least one of the major cardiac complications in the long term and the patients with high blood pressure and diabetes showed more complications.[14] In Gustafson et al study , the risk ratio of death in the presence of high blood pressure was 14.1 and showed that having high blood pressure increases the possibility of mortality following acute myocardial infarction.[17] In this study, the six month mortality and morbidity rates were higher in patients with a positive family history of the disease. In the study of Salarifaru et al the findings showed that if there is a positive family history, the prevalence and complications of acute heart attack increase. A positive family history of coronary artery disease in one of the first-degree relatives of a person under the age of 55 years in men and 65 years in women is considered a risk factor for coronary artery disease and determining the risk factors and the probability of coronary artery disease in a person, including people with a positive family history, considering that they are asymptomatic, was always discussed and disagreed.[13]

CONCLUSION

The results showed that the rate of mortality and morbidity increases with old age, female gender, having diabetes, having high blood pressure, having a positive

family history and has a direct relationship. The findings showed that streptokinase injection is associated with higher rate of mortality and morbidity than coronary intervention. According to this study, there was a direct relationship between old age and female gender with mortality and morbidity rates. More seriousness should be paid to the follow up of elderly patients (over 55 years old) and they should undergo short term and long term follow up for acute myocardial infarction on a regular basis prescribed drugs should be taken regularly and also in case of female gender, they should be placed in the high risk group and should be followed up regularly for prescription drugs, occurrence of any complications and previous vascular condition. Also, according to this study, there was a direct and significant relationship between being diabetic and high blood pressure and positive family history with mortality and morbidity rates therefore, adjusting these risk factors (blood sugar and blood pressure control) in patients with acute myocardial infarction can be useful in reducing their mortality and morbidity. In this study, there was a significant and direct relationship between the rate of mortality and morbidity with the type of treatment performed. In this way, streptokinase injection was associated with a higher mortality and morbidity rate than the initial coronary intervention, and therefore, there should be more sensitivity in the follow-up of patients who undergo thrombolytic therapy.

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